

Clean Version of Pending Claims

**FAULT-TOLERANT SYSTEM AND METHODS WITH TRUSTED MESSAGE
ACKNOWLEDGMENT**

Applicant: Mingqiu Sun et al.

Serial No.: 09/876,645

1. A method to be performed by a data processing system comprising:
providing distributed queuing of workflows, whose execution is requested by one or more execution-requesting clients, among a plurality of workflow engines; and
if a workflow is completed by a first workflow engine for an execution-requesting client, sending an explicit and delayed acknowledgement to the execution-requesting client, else assigning the workflow to a second workflow engine.
2. The method recited in claim 1, wherein providing is performed by a load manager.
3. The method recited in claim 2, wherein the load manager comprises a commercially available middleware product.
4. The method recited in claim 1, wherein the explicit and delayed acknowledgement is performed by a certified messaging capability.
5. The method recited in claim 4, wherein the certified messaging capability is performed by a load manager.
6. The method recited in claim 4, wherein the load manager comprises a commercially available middleware product.
7. The method recited in claim 4, wherein the certified messaging capability is performed by a certified message receiver forming part of the workflow.

8. The method recited in claim 4 and further comprising:
the certified messaging capability sending an explicit and delayed acknowledgement to the execution-requesting client if the workflow is completed by the second workflow engine.
9. A method to be performed by a computer network comprising a plurality of clients and a plurality of workflow engines:
providing distributed queuing of workflows, whose execution can be requested by one or more execution-requesting clients, among the plurality of workflow engines; and
determining whether a workflow has been completed by a first workflow engine on behalf of an execution-requesting client; and
if so, sending an explicit and delayed acknowledgement to the execution-requesting client;
otherwise, assigning the workflow to a second workflow engine.
10. The method recited in claim 9, wherein providing is performed by a load manager.
11. The method recited in claim 10, wherein the load manager comprises a commercially available middleware product.
12. The method recited in claim 9, wherein sending is performed by a certified messaging capability.
13. The method recited in claim 12, wherein the certified messaging capability is performed by a load manager.

14. The method recited in claim 12, wherein the load manager comprises a commercially available middleware product.

15. The method recited in claim 12, wherein the certified messaging capability is performed by a certified message receiver in the workflow.

16. The method recited in claim 12 and further comprising:
the certified messaging capability sending an explicit and delayed acknowledgement to the execution-requesting client if the workflow is completed by the second workflow engine.

17. A computer adapted for use in a computer network comprising a plurality of workflow engines, the computer executing a computer program, the computer program operating the computer in a fault-tolerant manner and comprising the operations of:

- requesting a workflow execution on behalf of a client;
- a distributed queuing capability assigning the workflow execution to a first workflow engine;
- determining whether the workflow execution has been completed by the first workflow engine; and
- if so, sending an explicit and delayed acknowledgement to the client;
- otherwise, assigning the workflow execution to a second workflow engine.

18. The computer recited in claim 17, wherein requesting is performed by a load manager.

19. The computer recited in claim 17, wherein sending is performed by a certified messaging capability.

20. The computer recited in claim 19, wherein the certified messaging capability is performed by a certified message receiver in the first workflow engine.

21. The computer recited in claim 19 and further comprising:
the certified messaging capability sending an explicit and delayed acknowledgement to the client if the workflow execution is completed by the second workflow engine.

22. (Amended) A computer network comprising:
a plurality of clients;
a plurality of workflow engines; and
at least one computer program, the computer program operating in a fault-tolerant manner and performing the operations of:
requesting a workflow execution on behalf of a client;
assigning the workflow execution to a first workflow engine;
determining whether the workflow execution has been completed by the first workflow engine; and
if so, sending an explicit and delayed acknowledgement to the client;
otherwise, assigning the workflow execution to a second workflow engine.

23. (Amended) The computer network recited in claim 22, wherein requesting is performed by a load manager having a distributed queuing capability.

24. The computer network recited in claim 22, wherein sending is performed by a certified messaging capability.

25. The computer network recited in claim 24, wherein the certified messaging capability is performed by a certified message receiver in the first workflow engine.

26. The computer network recited in claim 24 and further comprising:
the certified messaging capability sending an explicit and delayed acknowledgement to the client if the workflow execution is completed by the second workflow engine.

27. A computer-readable medium containing computer instructions for instructing a processor, the processor adapted for use in a computer network comprising a plurality of workflow engines, wherein the instructions comprise:

requesting a workflow execution on behalf of a client;
a distributed queuing capability assigning the workflow execution to a first workflow engine;
determining whether the workflow execution has been completed by the first workflow engine; and
if so, sending an explicit and delayed acknowledgement to the client;
otherwise, assigning the workflow execution to a second workflow engine.

28. The computer-readable medium recited in claim 27, wherein requesting is performed by a load manager.

29. The computer-readable medium recited in claim 27, wherein sending is performed by a certified messaging capability.

30. The computer-readable medium recited in claim 29, wherein the certified messaging capability is performed by a certified message receiver in the first workflow engine.

31. The computer-readable medium recited in claim 29 and further comprising:
the certified messaging capability sending an explicit and delayed acknowledgement to the client if the workflow execution is completed by the second workflow engine.

32. An article comprising a machine-accessible medium having instructions for instructing a processor forming part of a plurality of workflow engines, wherein the instructions, when accessed, result in a machine performing:

requesting a workflow execution on behalf of a client;

assigning the workflow execution to a first workflow engine;

determining whether the workflow execution has been completed by the first workflow engine;

and

if so, sending an explicit and delayed acknowledgement to the client;

otherwise, assigning the workflow execution to a second workflow engine.

33. The article recited in claim 32, wherein requesting is performed by a load manager having a distributed queuing capability.

34. The article recited in claim 32, wherein sending is performed by a certified messaging capability.

35. The article recited in claim 34, wherein the certified messaging capability is performed by a certified message receiver in the first workflow engine.

36. The article recited in claim 34 and further comprising:

the certified messaging capability sending an explicit and delayed acknowledgement to the client if the workflow execution is completed by the second workflow engine.